George's PINK PAGES December 2000

History of Honey Bees

SURPRISE! Apis mellifera were not indigenous to our western hemisphere, and the followers of Capt. John Smith as well as Miles Standish had to import honey bees from England in the early 1600's so that the new settlers could have some "sweets" in their diet. Unfortunately, some Americans put the existence of sugar in the same category as air and water, but the facts are that sugar was an imported expensive luxury from the South Pacific in 17th century Europe and was not introduced into the U. S. until 1751 in Louisiana, just 25 years before Jefferson wrote the Declaration of Independence. Imagine us today without candy, ice cream, pie, cake, cookies, Coca Cola or even sugar-cured hams! Honey, and hence "honey bees", was a vital necessity for early Americans; and now, in 2000, still a vital necessity in the pollination of our human food supply

Today, honey bees live in all parts of the world except the extreme polar regions near the North Pole and South Pole. There are many colonies of bees kept in both Alaska and Siberia, in fact Steve Peterson of Fairbanks, AK is an EAS Master Beekeeper, like me. Primitive man, maybe even Adam and Eve, harvested honey from bee's nests in hollow trees and rock crevices, and is portrayed in many rock paintings in Africa and Europe. Beekeeping, as we think of today, commenced when man learned to safeguard the future of swarms, established colonies from them, and even built some type of dwelling for them, perhaps in pottery vessels as shown in a wall painting about 1500 B.C. which shows smoke being used to harvest honey. Different parts of the world housed bees in those items readily available in their area, I. e., pottery, parts of hollow trees, baskets made of straw or wicker later improved to woven skeps, and even horizontal hives made out of hollowed out logs or stone discs.

Important Events in the 150 years between 1600 and 1851

Honey bees were imported to the New World, England's American Colonies. Beekeepers began to recognize the worth and quality of honey bees. Developments in beekeeping methods and management techniques gave the beekeeper more control over his bees, as well as viewing them INSIDE the hive.

Honey bees, the old "DARK" bee, apis mellifera mellifera, were first brought to America in 1622, to the Virgin Islands and Guadeloupe in 1688, to Australia in 1839, and to California in the early 1850's.

In Germany, Nickel Jakob wrote in 1568 that honey bees could raise a queen from eggs or very young larvae. In 1586, Luis Mendez of Spain was first to describe a queen as a female that laid eggs and the mother of all bees. In 1609, Englishman Charles Butler showed that drones were male bees; and Richard Remnant in 1637 showed that workers were females. It is interesting that nothing was known about the mating of a queen with a drone for about 150 years until Anton Janscha of Slovenia described the act in 1771. Prior to 1744, beeswax was confused with light yellow pollen until Hornbostel of

Germany detailed the origin of beeswax. Nectar was assumed to fall from the sky until Frenchman, Vaillant, showed in 1717 that nectar is produced in flowers. It wasn't until 1750 that Irishman Arthur Dobbs reported that the pollen collected by bees is the "male seed" of the flower which fertilizes the ovum. It took another 43 years (1793) before Sprengel clearly established the part played by bees in fertilizing flowers.

Francois Huber, a blind Swiss beekeeper, published his Observations in 1792, which properly laid the foundations of modern day bee science. I am the proud owner of an English translation published in 1821. It is absolutely "mind-boggling" what a BLIND scientist could fathom from the descriptions of bee activity by his sighted helper! Huber "invented" the "leaf-hive" which consisted of a number of frames hinged together at one side like the leaves of a book, and the bees built combs in these frames

Many other quasi famous beekeepers created many different types of hives during this 250 years, but all suffered the same problem: the combs were not removable from the hive except by CUTTING THEM AWAY FROM THE HIVE BODY.

Modern Beekeeping: 1851 to the Present

Perhaps there are a few who would disagree, but surely most would concur that Rev. Lorenzo Lorraine Langstroth did more for successful modern day beekeeping than any other individual in the world. Erroneously, he is most noted for building the first hive that featured removable frames as well as a desirable size. However, the removable frame and hive size were very secondary to his major discovery of: BEE SPACE. That "magical space" is defined as "greater than 1/4 inch, but smaller than 3/8 inch", and is recognized by the bees as OPEN space for occupation by bees only and any spaces smaller or larger are subject to having comb built in them. By utilizing this new finding, called BEE SPACE, Langstroth was able to design a hive where the bees did not seal parts together by burr comb, hence allowing frames to be removed one by one, inner covers not sealed down to frame tops, and bee walk space on the tops of frames that had another hive body with frames on top of the lower hive body. A Langstroth hive filled with bees could be disassembled, each part inspected for status or disease, and reassembled without damage to comb or bees. This could NOT be done with any other "housing" for bees that existed in 1851!

Just as the invention of the telephone opened the door to home to home communication, and the invention of the automobile opened the door for family visits with friends miles apart, the introduction of the Langstroth designed hive featuring BEE SPACE opened the door for easy beekeeping to every type of human: male or female, educated or uneducated, rich or poor, and those with investigative minds as well as those with status quo minds. Hence, the next 50 years were the years of inventing needed bee equipment and bettering existing bee equipment. Some of the more important things are:

M. Hruschka, an Austrian, invented the first frame extractor in 1865, which was followed by L. L. Langstroth's extractor in 1867. Moses Quinby invented the first bellows smoker in 1870. J. Mehring of Germany stamped out the first beeswax foundation in 1857, which

was followed by A. I. Root and A. Washburn developing the first machine roll foundation in 1875 using the idea of the twin roll clothes dryer. H. Laidlaw developed the first machine operated artificial inseminator of queens in 1944. L. L. Langstroth was part of a group that imported the first Italian Queens to the U. S. in 1860, and their "golden" color captured the desires of American beekeepers. F. Benton imported the first Carniolan bees to the U. S. from Germany in 1891.

In 1990, Dr. Eva Crane published a paper named Bees and beekeeping: science, practice, and world resources. I want to mention some of the figures and statements made in this paper:

The world now produces over 2 billion pounds of honey each year from 50 million hives indicating that the average hive production per year is 40 pounds. The population of humans in our world is estimated to be 5 billion people which indicates that there are 100 humans for each bee hive in the world. Beekeeping is practiced over a greater area of the earth's surface than any other single branch of agriculture; and the success of some parts of other branches of agriculture depend on beekeeping, because of pollination! WOW! The OLD World (Europe, Asia, and Africa) is more densely populated with honey bees as it is with people, but the NEW World (North and South America plus Australia) gives richer honey harvests, 48 pounds/year compared to only 31 pounds/year in the Old World. In the NEW World, because labor is so expensive, beekeeping equipment tends to be simple, standardized, and mechanized which contrasts with the OLD Worlds use of many different sizes, complicated, and much less mechanization. In the U. S., one skilled beekeeper can manage up to 1000, or even 2000 hives, whereas in Europe one man can look after only 100-300 hives. In the NEW World, there are more commercial beekeepers, although numbering less than 10% of the total. Average honey yield in individual countries vary from 40 pounds to 80 pounds per colony, but in the best beekeeping areas these production figures are 200 or even 300 pounds. The OLD World has a high proportion of hobby beekeepers who have an annual harvest of 10 to 40 pounds of honey per year.

In good areas, beekeeping can be done without the beekeeper (beeHAVER) knowing a great deal about the bees themselves, and maybe not really interested in the bees, or in beekeeper organizations. In complete contrast to this, the strongest beekeeper organizations are in the European countries with a high density of hives, but each providing only a small return. Such beekeepers often need a good knowledge of bees in order to maintain their colonies at all! WOW, what a difference in thinking! In spite of all our new and wonderful things of the 20th century like automobiles, planes, computers, antibiotics, wash & wear clothes, etc., one strong adverse factor stands out for beekeeping since World War II - the ever increasing speed and availability of air transport. This enabled honey bees to be taken relatively easily from one country or continent to another, and , unfortunately, diseases and parasitic mites went right along with the bees. South America imported African queen bees in 1957 for study, but an unskilled attendant let them escape into the wild, and Africanized honey bees entered the U. S. in 1990. The tracheal mite was first found in the U.S. in 1984, the Varroa mite in 1987, and the small hive beetle in 1998. Now in 2001, smart beekeepers and wary bee

scientists are worried about the spreading of another mite, tropilaelaps clareae which is spreading around the world; but I am more concerned about the CAPE BEE, apis mellifera capensis which can produce worker bees without the fertilization of drone bee spermatozoa. The entrance of the Cape Bee into the U. S. would have the same effect of declaring by law that we all stop speaking the English language and speak only in Swahili. We throw away all the existing bee books and start over. Since the world now functions on a "global" basis rather than a hemisphere basis or country basis, let me touch on the state of beekeeping over the world, and some facts might astound you. Europe (excluding the U.S.S.R.) has about 15 million bee hives with a density of over 8 hives per square mile compared to a world average of just over 1 hive per square mile, but the average honey yield is a measly 24 pounds per hive This 24 pounds per hive results in a total production of only 360 million pounds which is only half the demand of Europeans for honey, and hence they import an additional 340 million pounds from the NEW world and China. Although beekeeping was "wiped out" in the U.S.S.R. during World War II, honey is a strong part of the Russian life style; and now they are back up to about 8 million bee hives, averaging 50 pounds per hive, totaling 400 million pounds. It is difficult to get good statistics on the Asian countries, but estimates of 13 million bee hives yielding 40 pounds per colony totaling about 550 million pounds of honey have been made. However, we know that China is rapidly increasing their number of colonies and hence their honey production for export purpose. Beekeeping conditions in Africa differ from the rest of the world in that many of the beekeepers have not switched to modern hives and still use traditional hives and traditional methods of honey collection. This includes gathering lots of comb, pressing or squeezing the honey from it and selling the wax. The total wax yield, the largest on the world market, is several thousand metric tons each year. We have estimates of 14 million bee hives producing 200 million pounds of honey each year, which is only about 14 pounds of honey per hive. These figures do NOT include the small Southern area of Africa where the CAPE BEE predominates. Although South America and particularly Central America primarily have only the Africanized Bee, the beekeepers have learned how to utilize this aggressive bee for honey production. They have about 8 million hives, averaging about 42 pounds honey per hive, totaling 320 million pounds, and they export about 70% of that, or 230 million pounds. Have I saved the BEST for last when I talk about The United States and Canada? That depends on your point of view. The U. S. and Canada combined only have 5 million hives. The average yield in the U. S. is only 40 pounds per colony, but Canada has the highest average in the world of 140 pounds per hive! Although beekeeping is still predominantly a hobbyist pursuit, there are several thousand professional beekeepers. Many of them own 5,000 or more colonies and Richard Adee of South Dakota has 60,000 colonies. It is interesting that in the areas in the East, the climate is more like that in Europe, honey yields are lower than the West, holdings are smaller, but, as in Europe, the people tend to have a greater interest in the bees themselves rather than the honey production.

What about the Future? In spite of all the changes of the last several hundred years or even several thousand years, there are two things that have NOT changed: the climate which determines which bee forage will flourish, and the habits of the bees themselves. The pattern of beekeeping has changed through the centuries with man's colonization of

new regions of the world, and which now changes almost every decade with changing agricultural practices, because THESE affect the forage which provides the bees - and the beekeeper - their honey harvest! The promotion of greater crop yield per acre, the promotion of clean agriculture by killing nectar bearing weeds before they flower, and the rapid harvesting of fodder crops, all reduce the bee's forage area. In some areas, the control of insects which damage agricultural crops has destroyed wild bees and other beneficial insects whose nesting places may be endangered by the reduction of waste land. This has left the so-called domesticated honey bee as the ONLY pollinator available in large numbers, and will bring a new form of financial return to the beekeeper in pollination rental.

Right back to the all that I have been "preaching" for the past 20 years - CHANGING TIMES. You have a choice: Do what Daddy did, and FAIL; or LEARN and CHANGE, and survive. It is up to you!

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George's PINK PAGES December 2000 Why have an UPPER ENTRANCE?

In spite of the fact that almost every bee scientist, bee researcher, professional apiculturists, and every bee book strongly recommends an upper entrance for every colony of bees in BOTH summer and particularly winter, hobbyist beekeepers seem to either overlook this or ignore the advice. Maybe it is just another example of anthropomorphic thinking about "letting the 'house' get cold". Years ago, Root made inner covers with half an auger hole drilled in the front edge of the cover to serve as an upper entrance, but Root discontinued hive manufacturing about 1990. Recently, I persuaded Steve Forrest to manufacture the Brushy Mountain Bee Farm inner cover with this same upper entrance.

Surely, you must know how important hive ventilation in BOTH summer and winter is to successful beekeeping. How can anything be well ventilated with just one "entrance"? If you want fresh air in, you must create an "exit" for the "old" air to go out. We all know that hot air rises, so we install an attic fan in our house. Further, why should a forager bee returning with a heavy load of nectar "fight her way" through the highly congested brood chamber to get up in the supers to deposit her load of nectar, and then repeat her "fight" through the congested brood chamber to go out and do more foraging? Why not have an UPPER ENTRANCE that allows the forager bee to enter or leave the hive without going through the brood chamber congestion?

Some beekeepers like to drill a 1" hole near the hand hold in a super, and I don't like that for TWO reasons: 1) the hole becomes an entrance for mice, adult wax moths, and other pests when I have my supers stored in the winter, and 2) I forget about the hole and put my hand there to move the super and get stung. Then, there are other beekeepers who like to prop open the inner cover by inserting sticks or twigs between the edge of the super and inner cover. Invariably, those sticks or twigs will get "lost" any time you try to remove the inner cover.

JUST MAKE A PERMANENT UPPER ENTRANCE IN ONE EDGE OF THE INNER COVER! Most inner covers have a 3/4" edge around a sheet of thin masonite or plywood, and this sheet material is NOT in the center of the 3/4" edge boards, but generally is placed so that the inner cover has a "shallow side" supposedly for summer use and a "deep side" for winter use. This is just silly, and no body bothers! Just chisel out a piece of wood about 1/4" to 3/8" thick, and the size of a postage stamp from the center of the 16" side of the inner board. Just imagine an IMIRIE SHIM with a sheet of masonite in the center of it.

Use it on the top most super, entrance on the down side the year around, summer and particularly winter, and have the telescoping top PUSHED FORWARD so that bees can walk out of the entrance hole, walk down the face of the super about 2" and fly away. Why do I continue to say "particularly WINTER"? Clustered bees eat honey to keep warm in the winter. Their exhaled breath is both damp and warm, just like you exhaling warm breath on your glasses to clean them. Warm air RISES, and it need an upper exit to leave the hive so that the damp air does not condense into cold water droplets on the cold inner cover and rain down on the bee cluster. Of course in the summer during nectar gathering season, this upper entrance does the same job for the top super that IMIRIE SHIMS do for the supers beneath the top super.

EVERY COLONY OF BEES SHOULD HAVE AN UPPER ENTRANCE IN PLACE ALL 365 DAYS OF THE YEAR!

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